ORIGINAL ARTICLE

A Swedish survey of occupational therapists’ involvement and performance in driving assessments

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Abstract
The purpose of this study was to examine the extent to which occupational therapists (OTs) are involved in driving assessments in Sweden and how these assessments are performed. A questionnaire was sent to 154 geriatric, rehabilitation, and neurological clinics, and additionally directly to 19 OTs who had purchased a test battery specifically used for driving assessments. The response rate was 60%. Of those responding, 57% reported being involved in fitness-to-drive assessments. However, such assessments were carried out in various manners and diverse methods were used, ranging from unstandardized activity assessments to a test developed specifically for driving assessments. Only 19% used on-road driving tests as a complement to the clinical assessments. Apart from the lack of appropriate methods, the respondents said that they did not have sufficient knowledge to perform driving assessments and expressed a need for further education. In the future it seems necessary for OTs in Sweden to undergo specialized training and perform the assessments on a regular basis to maintain a high level of competence as driving assessors.

Key words: Cognitive assessment, driving assessment, fitness to drive, occupational therapy, on-road test

Introduction
Driving is an instrumental activity of daily living (IADL) and plays an important role in modern society (1,2). Even when other forms of transportation are available, driving often remains the most satisfying and preferred travel mode (3), and is, in fact, taken for granted by most people. However, compared with other “overlearned” skills, driving is a very complex activity that cannot be reduced to the mere technical operation of a vehicle, and can therefore never be completely routine (4).

The concept of driving competence has two aspects or components: driving skill and medical-psychological fitness to drive1 (5). “Driving skill refers to the smoothness and safety of driving in actual traffic, using one’s knowledge, basic abilities, and resources efficiently, and is generally believed to be strongly dependent on learning and experience” [5, p. 151]. Fitness to drive, on the other hand, is a medico-legal concept, implying that the licence holder fulfils the necessary physical and mental requirements for safe driving. Some of these requirements, such as visual acuity, are precisely defined in the legal statutes of most countries, sometimes also on a supranational level (e.g., within the European Union). For the individual driver, the interaction between fitness to drive and driving skill may be complex. Brouwer & Ponds mention that “safe driving probably requires much less from basic abilities and resources when one is already very skilled than when beginning to drive” [5, p 151]. Moreover, it is not technical driving skill in itself that is crucial for safe driving but, rather, the extent to which drivers use their skill in driving safely (6).

Medical conditions, for example following a disease or trauma, often call into question a person’s fitness to drive. In Sweden, the responsibility of
determining whether a patient fulfils legal medical requirements for licence holding is limited to physicians (7). In fact, as in the Czech Republic, Denmark, Finland, Latvia, Lithuania, Norway, Poland, and Portugal, physicians working in Sweden are legally required to report patients who are not medically fit to drive (8). However, assessments of driving competence are often demanding, not least because of the above-mentioned interaction between fitness to drive and driving skills. It has previously been shown that a medical assessment alone is insufficient to identify older patients who have an increased risk of crashes (9). This also seems to be recognized by many Swedish primary care physicians: as regards the information sources on which they base their judgements of fitness to drive of their older patients, 34% of the physicians indicated that these sources were “sometimes” sufficient, and another 7% answered that they were “seldom or never” sufficient (10). Therefore, it appears reasonable to choose a multidisciplinary approach to assess fitness to drive. In this context, occupational therapists (OTs) have an important role to play.

In some other countries, OTs have a longstanding involvement in fitness-to-drive assessments. In the UK, there are 15 Mobility Centres, linked to the Department of Transport (11). These centres usually employ a number of OTs who assess fitness to drive of clients with physical or cognitive impairments, or both. Belgium also has a centre (CARA – the Center for Determination of Fitness to Drive and Car Adaptation), where OTs work as driving assessors (12). According to a survey by Korner-Bitensky and co-workers (13), OTs were the professionals most often (68%) working with driving assessments in the United States and Canada. In several countries, such as the UK, the United States, and Australia, there are specialized training and courses in this area, whereas this is not the case in Sweden. In Australia, specialized OTs have the important role of advising the licensing authority if their clients are not fit to drive (14,15).

From previous contacts with a number of OTs working in Sweden, the authors of the present investigation were aware of the fact that many of them take part in driving assessments. Moreover, on an individual level, there were accounts of recurrent problems related to this kind of work, giving the impression that there was a high level of frustration and dissatisfaction among many OTs. To determine possible solutions to this state of affairs, a necessary first step appeared to be to conduct a systematic study examining the extent to which OTs in Sweden do assess driving or fitness to drive, and, when they do, how these assessments are performed. Examples of specific questions were the diagnostic groups targeted by such assessments, the methods used, problems encountered, and the type of training that the OTs either had received or felt that they needed.

Materials and methods

The questionnaire

A questionnaire was developed containing 18 items related to the involvement of the responding OTs in driving assessments. The OTs were first asked whether they performed such assessments at all, and, if so, to which diagnostic categories their patients belonged. Other main topics were: (a) the professional categories involved locally in the assessments, (b) the methods used (i.e., practical on-road test and/or cognitive tests), (c) whether the assessments included the need for vehicle adaptation, and (d) whether the respondents felt competent to perform driving assessments and whether they had had any continuing education or specialized training in this area. The questionnaire contained items with fixed-response alternatives, as well as open-ended questions.

Procedure

From an address database used to distribute pharmaceutical information to physicians and medical institutions in Sweden, 154 addresses of geriatric, rehabilitation, and neurological clinics were obtained. These clinics were located nationwide and were of all sizes, ranging from university clinics to regional or local facilities, representing the facilities that were relevant to our aim. The questionnaires were sent to the clinic management with a covering letter, requesting the recipient to forward the questionnaire to the clinic’s occupational therapist. In addition, 19 questionnaires were sent directly to OTs who had purchased a test battery specifically used for driving assessments.

Of the 173 questionnaires, 76 (44%) were completed and returned. After one reminder, 21 more were received. Of the 76 non-responders, 9 were randomly selected for further analysis. Six of those nine indicated that they had not received the questionnaire and were sent a new one, which was subsequently returned. Their responses did not differ from those of the sample who received only one questionnaire. Two clinics did not employ an occupational therapist and the specialty of the remaining clinic was not relevant to our purpose. In total, 103 questionnaires were returned, bringing the total response rate to 60%.
Results

Fitness-to-drive assessments at the clinics

More than half of all responding OTs (57% or 59/103) indicated that they were involved in the assessments of patients’ fitness to drive. However, responses varied considerably, depending on the type of facility considered: only 39% (7/18) of OTs working in university clinics stated that they assessed fitness to drive, while this was the case for 62% (47/76) of other types of clinics (in regional or county hospitals) and for 56% of the remaining facilities (5/9; e.g., primary care facilities or a specialized driving assessment unit). Only two of the respondents were working full time on driving assessments.

The main diagnoses giving rise to fitness-to-drive assessments were stroke (for 90% of the 59 responders who were involved in such assessments), traumatic brain injury (56%), dementia or cognitive dysfunction (54%), functional disabilities (8%) such as spinal cord injury or rheumatism, and neurological disorders other than stroke, such as multiple sclerosis and Parkinson’s disease (14%).

In addition to the responding OTs, professional categories such as physicians (97%), neuropsychologists (63%), and physiotherapists (31%) were reported as being involved in the assessments. A few assessment teams also included social workers, speech therapists, and nurses. The need for technical vehicle adaptations was assessed by 31% of the OTs working alone, and another 12% carried out such assessments together with other team members.

Reasons given for not assessing fitness to drive were, for example, that “the patients are assessed by others” (80%), that “fitness to drive is not an issue at the time when they are staying in our clinic” (7%), or that “fitness to drive is not a relevant issue for our patients” (7%). However, there were also indications that there were sometimes other reasons for not performing driving assessments, despite a possible objective need: “the issue is never discussed in the team”, “there is no demand for these assessments from the physicians”, “the OT does not assess fitness to drive specifically, partly because there is no demand for it”, “these assessments have been put aside, because it has not been possible, within our clinic, to agree on a policy for fitness-to-drive assessments”.

Cognitive assessments

As shown in Table I, the respondents used a variety of cognitive screening methods, test batteries, individual cognitive tests, or structured activity observations.

<table>
<thead>
<tr>
<th>Method and reference</th>
<th>Number of responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>(NorSDSA) Nordic Stroke Driver Screening Assessment (22)</td>
<td>29</td>
</tr>
<tr>
<td>(AMPS) Assessment of Motor and Process Skills (23)</td>
<td>25</td>
</tr>
<tr>
<td>Cognistat (24)</td>
<td>12</td>
</tr>
<tr>
<td>Rivermead Behavioural Memory Test (25)</td>
<td>11</td>
</tr>
<tr>
<td>Unspecified Activity Assessments</td>
<td>8</td>
</tr>
<tr>
<td>Trail Making Test (26)</td>
<td>7</td>
</tr>
<tr>
<td>Mini-Mental State Examination (27)</td>
<td>6</td>
</tr>
<tr>
<td>Balloons Test (28)</td>
<td>4</td>
</tr>
</tbody>
</table>

The most frequent instrument was a battery of cognitive tests developed specifically to assess cognitive aspects of fitness to drive in stroke patients (Nordic Stroke Driver Screening Assessment, NorSDSA). Also fairly common was a structured observational method (Assessment of Motor and Process Skills, AMPS) used to evaluate performance of everyday tasks.

Some respondents showed an awareness of the fact that the methods used were unspecific: “we do not assess only driving capability with our instruments”; “we do not make a real fitness-to-drive assessment, only a simple cognitive assessment”; “we do not use specific tests for driving, but carry out a general activity assessment”. Others expressed a wish for (better) assessment methods: “I feel unsure because of a lack of tests”; “we feel that we do not have any good assessment instruments”.

On-road testing

Altogether, 32% of all respondents indicating that they assessed their patients’ fitness to drive indicated that an on-road assessment of some type was performed. This was the case for 2/7 university clinics, 17/48 of other clinics/primary care facilities and the specialized driving assessment unit. About one fifth (19%, i.e. 11/59) of the OTs who had reported being involved in driving assessments stated that they used on-road driving tests as complements to the clinical assessments. One OT indicated that she conducted the on-road test alone, and 10 additional respondents did so together with a driving expert (either a driving instructor, in nine cases, or a driving examiner from the Swedish Road Administration, in one case). Five respondents indicated that they used a standardized route for the on-road tests. A structured observational scoring sheet was used by five OTs and seven driving experts. Five OTs stated that they did not themselves participate in the on-road tests. Instead these were carried out by the
driving experts alone (i.e., driving instructors and driving examiners).

Among OTs who did not use on-road tests, some expressed safety and standardization concerns: “If an OT should be present at a on-road test, dual controls should be required, as well as a national-level scoring sheet”; “as an OT, I should never have to get into a car alone with a patient”. Others deplored the lack of collaboration with driving experts: “we have no possibility to work together with driving examiners of the Road Administration (they decline despite pressure)”.

The OTs’ status as fitness-to-drive assessors

Several responding OTs commented that their driving assessment work was in demand at their respective clinics and that they felt appreciated in doing these tests. Others, however, indicated that their superiors did not consider driving assessments as the primary task of an OT and therefore did not allow them to attend specialized courses. Also, many physicians forgot the issue of fitness to drive. In one case, the OT stated that she/he sometimes was the only one to recognize the need for an assessment in a patient, but that she/he was unfortunately not able to participate in the assessment. On the other hand, the fear was also expressed that OTs, instead of the physicians, might be made to take the responsibility in determining the fitness to drive of the clinic’s patients.

Knowledge and competence

In an open-ended question, the respondents were asked to state their views on their own knowledge and competences. Most of the OTs (83%) indicated that they did not have sufficient knowledge regarding the assessment of fitness to drive. Continuing education within the area to increase knowledge and competence was the most frequent suggestion (43%) to improve matters. The OTs expressed a wish to gain a deeper knowledge of the physical and cognitive abilities needed for safe driving, but also information on guidelines, laws, and regulations. The need for standardized tests or assessment instruments was expressed by 39% of the respondents.

Several respondents wanted to conduct practical on-road tests or driving observations and to cooperate with driving experts (driving instructors or driving examiners). Some OTs mentioned that they felt alone as assessors and would appreciate working together with members of other professional groups, such as neuropsychologists. They also felt the need for networks and contacts with other OTs working in the same field.

Discussion

The results indicated that fitness-to-drive assessments at some level were performed by 59 of the 103 responding OTs. To a greater extent this was the case in relatively smaller facilities (regional or county hospitals, or primary care facilities, as opposed to university hospitals), probably due to more rapid discharge in larger, more specialized facilities such as the latter. Diagnostic groups targeted by such assessments were mainly stroke, head injury, and dementia or cognitive dysfunction. In the present study, patients suffering from disorders other than the ones treated at the selected clinics, for example psychiatric disorders, were not assessed by the respondents.

When assessing cognitive fitness to drive, very diverse methods were used by the OTs, ranging from more global assessments of ADL abilities or basic cognitive screening to more specific tests. In close to one-third (19/59) of the clinics considering the fitness to drive of their patients, on-road tests were performed, practically always in the presence of a driving expert. Only 11 responding OTs reported being present themselves at the on-road tests. An overwhelming proportion of the respondents felt that they did not have sufficient knowledge to perform driving assessments, and many expressed the need for further education. Related problems were the lack of appropriate methods to assess (cognitive) fitness to drive, no established cooperation with driving experts (instructors or examiners), or some respondents’ experienced that their involvement in driving assessments was not encouraged in their own clinics.

The questionnaires were sent to the clinic management, who were asked to forward them to the OTs. One explanation (that was confirmed by the analysis of non-responders) for the non-response rate of 40% might be that some questionnaires never reached the clinics’ OTs. Another explanation may be that occupational therapists at some hospitals belong to a specific organization, serving different clinics, and that one or two questionnaires were completed, whereas a total of three may have been sent to the hospital in question.

The survey indicates that there is a certain awareness among OTs regarding the assessment of fitness to drive. However, such assessments are carried out in various manners: some OTs include the consideration of fitness to drive in the global assessment of ADL abilities, while others perform more or less appropriate cognitive tests. Still others
complement their clinical assessment by an on-road driving test or leave the responsibility of the on-road assessment to external experts.

The lack of guidelines for the clinics certainly accounts for this diversity of approaches, and may probably be one underlying cause for the structural problems described by some respondents, such as physicians “forgetting” the issue and OTs not being asked to perform driving assessments or being denied special training courses. Obviously, in a period of stringent economy in the public domain, additional costs (for example those entailed by the participation of driving examiners in on-road tests) are not easily accepted, in particular as it may be argued that driving assessments are not really the responsibility of the healthcare system. However, physicians are legally responsible for decisions on their patients’ fitness to drive and in that perspective the findings of the present study are alarming. The contribution of OTs to these decisions is potentially very valuable but requires that they possess both adequate knowledge and tools. Both these requirements are fulfilled at some clinics but obviously not all. OTs who include driving in the normal repertoire of daily activities are competent in assessing it from an activity perspective, a unique feature of healthcare staff not accessible to driving experts. Such an OT contribution could both initiate and strengthen the fitness-to-drive assessment. One way to achieve this goal could be to for the Swedish Road Administration to stipulate that an OT assessment should be part of the physician’s fitness-to-drive assessment in cases where this is medically relevant.

Given both the medical requirements on licence holding and the cognitive demands of the driving task, it is obvious that the assessment of fitness to drive should not be limited to a general examination of functioning or to a basic assessment of sensorimotor skills. Furthermore, as observed in a review by Falkmer & Nielsen (16), even when cognitive tests are used most of them are not validated against measures of driving performance and, hence, information regarding their sensitivity and specificity is lacking. They also add that the majority of tests used by OTs tap skills on the operational and tactical levels of Michon’s hierarchical level of driving behaviour (17). This means that cognitive skills related to basic manoeuvring of the vehicle under time pressure, as well as to the handling of different traffic situations, are taken into account but that behaviour on the strategic level, involving planning and decision-making on an overall level, is not. The different limitations of cognitive tests described here imply that the wish for “the” test that will tell us, once and for all, whether the patient is fit or unfit for driving is not a realistic solution.

An on-road test often makes it possible to determine whether cognitive impairments may be compensated for by the satisfactory driving skills of (usually) experienced drivers, as described in the introduction. Despite the fact that OTs are used to performing activity assessments, only a relatively small proportion (about one-fifth of those who did driving assessments at all) reported testing their patients on the road. Some possible reasons for this have already been mentioned. In addition, conducting an on-road test requires specific competences on the part of the OT including the knowledge needed to determine a standardized route and to use an appropriate scoring sheet, for example P-Drive (18). When the OT does not have the opportunity to conduct the on-road test, and the responsibility for it is left to a driving instructor or a driving examiner, this implies that there is no observer who can verify whether clinically detected impairments have an impact on driving behaviour.

As mentioned previously, in some other countries OTs play an important role in driving assessments. For example, their assessments include both off-road (e.g., physical and perceptual-cognitive tests) and on-road tests. Furthermore, in Victoria, Australia, OTs have special guidelines and competence standards as driver assessors (19). During on-road tests, they must use a dual-control car with a driving instructor, to ensure the safety of the driver and other road users. As a first step to acquire such an important role in driving assessments, endeavours of OTs in Sweden should focus on an increasing use of appropriate standard testing procedures as well as the creation of best practice OT driving assessment guidelines.

For many patients, there is a real possibility to take up driving again after a disease or an injury that has led to a physical disability. However, relatively few OTs working in Sweden take part in assessments of the need for technical vehicle adaptations. In this respect, they differ from their colleagues in the USA and the UK, where such assessments are more common (11,20). Persons who are no longer able to drive run the risk of becoming isolated and dependent on their families or transportation services, thus having a lower quality of life than previously (21). OTs have an important function in promoting safe mobility in persons with physical limitations, thereby also contributing to the cost-efficient use of public resources.

Occupational therapists have professional competences encompassing a variety of domains, for example the measurement or assessment of physical abilities, cognitive skills, and activities. This makes them a professional group that would appear to have an obvious role to play in the fitness-to-drive
assessment of persons with different diseases or disabilities. However, it is clear that their training is not sufficient for this purpose. Today, OTs in Sweden have very few opportunities to undergo specialized training and acquire more experience. Also, to maintain a high level of competence as a driving assessor within the healthcare system, it is necessary to perform assessments on a regular basis, both off-road (e.g., cognitive tests) and on-road (driving tests). In the future, it is necessary to establish basic and advanced training programmes at the universities for those OTs who wish to work with driving assessments and OTs must also be prepared to initiate or take part in research projects to give their work a scientific basis.

Acknowledgements

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Notes

1. Fitness to drive = the medical and functional requirements for driving.
2. Driving assessment = assessment of the complex interaction between physical, cognitive, perceptual, and psychological abilities while driving a vehicle.

References
